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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/521,335

01/10/2005

Thomas David Paul Allsop

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9160

28062

7590

10/17/2006

BUCKLEY, MASCHOFF, TALWALKAR LLC  
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NEW CANAAN, CT 06840

EXAMINER

CHU, CHRIS H

ART UNIT

PAPER NUMBER

2874

DATE MAILED: 10/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/521,335

Applicant(s)

ALLSOP ET AL.

Examiner

Chris H. Chu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 22 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 23-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 23-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 6/06.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

Applicant's Amendment filed June 22, 2006 has been fully considered and entered.

### ***Claim Objections***

Claim 31 is objected to because it depends from cancelled claim 1. For the purposes of examination, the examiner will consider claim 31 to depend from independent claim 23.

Claim 32 is objected to because the term "of the or each" preceding "optical waveguide" renders the claim indefinite. For the purpose of examination, the examiner will consider the claim to read "of the optical waveguide."

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 23-25, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hubner et al. (WO 00/70307 from applicant's Information Disclosure Statement).**

Regarding claim 23, Hubner et al. discloses a surface profiling apparatus comprising an optical waveguide including a sensor section comprising an optical waveguide grating curvature sensing device which is a long period grating (see abstract), optical interrogation means operable to determine the curvature experienced comprising an optical source coupled to one end of the waveguide operable to generate a narrow spectral bandwidth signal at a wavelength within the spectral range of the optical waveguide grating curvature sensing device and an optical detection means operable to detect changes in the spectral transmission profile to determine the curvature experienced by the optical waveguide grating curvature sensing device (see page 6, paragraphs 2, 3 and page 11, paragraphs 3, 4), whereby the waveguide is couplable to a surface to be profiled (see page 15, paragraph 2).

Still regarding claim 23, Hubner et al. teaches the claimed invention except for a plurality of sensor sections or the optical signal sent by the optical interrogation means to be wavelength modulated at a modulation frequency. However, optical signals modulated to have a desired modulation frequency are well known in the art and since Hubner et al. discloses an optical detection means operable to detect the transmitted light, it would have been obvious for the detection means to be operable to measure the amplitude of the signal <sup>of</sup> at least one harmonic of the modulation frequency for the purpose of detecting changes. Also, it would have been obvious to one having ordinary

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skill in the art at the time the invention was made to provide multiple sensor sections for the purpose of measuring the curvature at multiple positions.

Regarding claim 24, Hubner et al. discloses the optical waveguide to be an optical fiber comprising a core, an inner cladding layer, and a first outer cladding layer in page 5, paragraphs 2 and 3.

Regarding claim 25, Hubner et al. discloses a second outer cladding layer (absorbing layer in page 5, paragraph 3) surrounding the first outer cladding layer in order to isolate light propagating within a cladding mode of the inner cladding layer from a medium surrounding the second outer cladding layer.

Regarding claim 31, Hubner et al. discloses the optical interrogation means to be of a synthetic heterodyne based optical interrogation means in page 12, paragraph 1.

Regarding claim 32, Hubner et al. teaches the claimed invention as well as the detection means to comprise a photodetector except for a plurality of lock-in amplifiers or synchronous detectors operable to measure the amplitude of the signal at least one harmonic of the modulation frequency. However, as stated in the rejection of claim 23 above, since Hubner et al. discloses an optical detection means operable to detect the transmitted light, it would have been obvious for the detection means to be operable to measure the amplitude of the signal <sup>of</sup> at least one harmonic of the modulation frequency <sub>A</sub> for the purpose of detecting changes.

Still regarding claim 32, Hubner et al. also teaches data processing means connected to the photodetector to calculate the curvature experienced in page 11, paragraph 1. Though Hubner et al. does not specifically teach calculation of the ratio of

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the amplitudes or the arc tangent of said ratio, Hubner et al. teaches calculation of the curvature using "standard formulas" and as such, includes calculation of any values necessary to determine the curvature.

**Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hubner et al. (WO 00/70307 from applicant's Information Disclosure Statement) in view of Allsop et al. (EP 1372006 A1).**

Regarding claim 26, Hubner et al. teaches the claimed invention except two long period gratings arranged together to form an in-line Mach Zehnder interferometer. Allsop et al. teaches two long period gratings arranged together to form an in-line Mach Zehnder interferometer in the abstract. Since both inventions are waveguide grating devices, it would have been obvious for one having ordinary skill in the art at the time the invention was made to use the two long period gratings arranged together to form an in-line Mach Zehnder interferometer as disclosed by Allsop et al. in the sensor disclosed by Hubner et al. for the purpose of providing a different type of sensor that can be varied according to the space length between the long period gratings.

**Claims 27-30 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hubner et al. (WO 00/70307 from applicant's Information Disclosure Statement) in view of Wilson (WO 93/22624 from applicant's Information Disclosure Statement).**

Regarding claim 27, Hubner et al. teaches the claimed invention except for coupling means to couple the waveguide to the surface, comprising a carrier member in which the sensor sections are fixed to or embedded within the carrier member. Wilson

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teaches a waveguide sensor device fixed on a carrier member coupled to a surface in Fig. 4 and page 9, paragraphs 2 and 3. Since both inventions are waveguide sensor devices, it would have been obvious for one having ordinary skill in the art at the time the invention was made to use the carrier member as disclosed by Wilson to fix the sensor disclosed by Hubner et al. for the purpose of attaching the sensor to a surface.

Regarding claim 28, the proposed combination of Hubner et al. and Wilson teaches the claimed invention except for a support structure comprising a plurality of carrier members. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a structure in which to place a plurality of carriers for the purpose of measuring the curvature at multiple points on a surface.

Regarding claims 29 and 30, the proposed combination of Hubner et al. and Wilson teaches the claimed invention except for the carrier member to comprise a flexible skin fixed to a partially rigid expandable skeleton structure. However, Wilson teaches the carrier member to be deformable and used to measure respiratory movement in Fig. 4 and page 9, paragraphs 3-5 and page 10, paragraphs 2-3. As such, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a partially rigid, expandable skeleton structure with a flexible skin for the purpose of accurately measuring the change in curvature of the surface.

Regarding claim 33, Wilson teaches a respiratory function monitoring apparatus for use on the rib or torso utilizing the surface profiling apparatus in page 9, paragraph 3.

### ***Response to Arguments***

Applicant's arguments with respect to claims 23-33 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation



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under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris H. Chu whose telephone number is 571-272-8655. The examiner can normally be reached on 8:30 AM - 5:00 PM Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on 571-272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general or clerical nature should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562.



Chris H. Chu  
Patent Examiner  
October 12, 2006

  
MICHELLE CONNELLY-CUSHWA  
PRIMARY EXAMINER  
10/16/06